LISTING OF CLAIMS

1 (Original): A circuit for down-converting a differential input signal x(t) comprising:

a differential transconductance input cell consisting of separate positive and negative channels for receiving positive and negative channels of said input signal x(t) and amplifying said positive and negative channels of said input signal x(t);

a first differential mixer for receiving said amplified input signal x(t), and mixing said input signal x(t) with a first mixing signal $\phi 1$, to generate an output signal $\phi 1$ x(t);

a second differential mixer for receiving said signal $\phi 1$ x(t) as an input, and mixing said signal $\phi 1$ x(t) with a second mixing signal $\phi 2$, to generate an output signal $\phi 1$ $\phi 2$ x(t);

a pair of current sources Ia and Ib for providing current to respective outputs of said positive and negative channels of said differential transconductance input cell, to reduce the current drawn from said first differential mixer, said current sources Ia and Ib being trimmed in a complementary manner where Ia = I + ΔI, and Ib = I - ΔI.

2 (Currently amended): The circuit of ~~claim 1~~ claim 1, further comprising means for setting the level of ΔI.

3 (Currently amended): The circuit of ~~claim 1~~ claim 1, further comprising means for manipulating ΔI to reduce the IM2 and DC offset in the output signal $\phi 1$ $\phi 2$ x(t), whereby matching parameters for said mixers can be relaxed.

4 (Currently amended): The circuit of ~~claim 1~~ claim 1, wherein ΔI is determined during a two-tone test, as the current level which minimizes IM2 output at baseband.

5 (Currently amended): The circuit of ~~claim 1~~ claim 1, wherein said first mixing signal $\phi 1$ and said second mixing signal (P2 are chosen to demodulate said input signal x(t) to baseband.

6 (Currently amended): The circuit of ~~claim 3~~ claim 3, further comprising a filter electrically connected between said first mixer and said second mixer.

7 (Currently amended): The circuit of ~~claim 4~~ claim 6, wherein said filter comprises a high pass filter.

8 (Original): The circuit of claim 1, where said first mixing signal $\phi 1$ and said second mixing signal $\phi 2$ are chosen to emulate a direct conversion local oscillator signal, where $\phi 1 * \phi 2$ has significant power at the frequency of said local oscillator signal being emulated, and neither of said $\phi 1$ nor said $\phi 2$ having significant power at the carrier frequency of said input signal x(t) or said LO signal being emulated.

9 (Original): The circuit of claim 6, where said first mixing signal $\phi 1$ is a multi-tonal signal, and said second mixing signal $\phi 2$ is a monotonal signal.

10 (Currently amended): The circuit of ~~claim 1~~ claim 1, wherein:

each of said current sources Ia and Ib comprises a plurality of switchable transistors, each with different performance parameters; and

said circuit further comprises a means for switching the various transistors in and out of the circuit to vary the current supplied.

11 (Currently amended): The circuit of ~~claim 1~~ claim 1, wherein the output of each of said current sources Ia and LB is modulated using a common mode feedback circuit.

12 (Currently amended): The circuit of ~~claim 10~~ claim 10, wherein said first mixer comprises an active mixer.

13 (Currently amended): The circuit of ~~claim 14~~ claim 12, wherein said first mixer comprises an active mixer having adjustable performance.

14 (Currently amended): The circuit of ~~claim 20~~ claim 1, wherein said second mixer comprises a passive mixer.

15 (Currently amended): The circuit of ~~claim 22~~ claim 7, wherein said high pass filter comprises a resistor dividing network for setting the common mode voltage output.

16 (Currently amended): The circuit of ~~claim 5~~ claim 5, wherein said first mixing signal and said second mixing signal are generated by a voltage-controlled oscillator.

17 (Currently amended): The circuit of ~~claim 6~~ claim 16, wherein said voltage-controlled oscillator is tuned to a multiple of the carrier frequency of said input signal x(t).

18 (Currently amended): The circuit of ~~claim 6~~ claim 16, wherein said voltage-controlled oscillator is tuned to a divisor of the carrier frequency of said input signal x(t).

19 (Original): A method of signal demodulation for a circuit having

a differential transconductance input cell consisting of separate positive and negative channels for receiving positive and negative channels of said input signal x(t) and amplifying said positive and negative channels of said input signal x(t);

a first differential mixer for receiving said amplified input signal x(t), and mixing said input signal x(t) with a first mixing signal $\phi 1$, to generate an output signal $\phi 1$ x(t);

a second differential mixer for receiving said signal $\phi 1$ x(t) as an input, and mixing said signal $\phi 1$ x(t) with a second mixing signal $\phi 2$, to generate an output signal $\phi 1$ $\phi 2$ x(t);

a pair of current sources Ia and Ib for providing current to respective ones of said positive and negative channels of said differential transconductance input cell, to reduce the drawn from said first differential mixer; said current sources Ia and Ib being trimmed in a complementary manner where $Ia = I + \Delta I$, and $Ib = I - \Delta I$;

said method comprising the steps of:

injecting a two-tone signal at said input;

measuring IM2 at the baseband output of said circuit;

determining the level of ΔI which minimizes IM2;

recording the level of ΔI which minimizes IM2; and

using said recorded level of ΔI during normal operation of said dowh-convertor.

20 (Original): A method of down-converting a differential input signal x(t) comprising the steps of:

amplifying positive and negative channels of said input signal x(t) using a differential transconductance input cell consisting of separate positive and negative channels;

mixing said amplified input signal x(t) with a first mixing signal $\phi 1$, to generate an output signal $\phi 1$ x(t), using a first differential mixer;.

mixing said signal $\phi 1$ x(t) with a second mixing signal $\phi 2$, to generate an output signal $\phi 1$ $\phi 2$ x(t), using a second differential mixer; and

providing current to respective ones of said positive and negative channels of said differential transconductance input cell, using a pair of current sources Ia and Ib, reducing the current drawn from said first differential mixer; and

trimming said current sources Ia and Ib in a complementary manner where Ia = I + ΔI, and Ib = I - ΔI;

wherein AI can be manipulated to reduce the IM2 and DC offset in the output signal $\phi 1$ $\phi 2$ x(t), and wherein matching parameters for said mixers can be relaxed.

21 (Currently amended): A computer readable memory medium for storing software code executable to perform the method steps of claim 19 ~~claim 29~~.

22 (Canceled).